East Fork San Gabriel River 2009 Summary Report

June 23-25, 2009

State of California

Natural Resources Agency

Department of Fish and Game

Heritage and Wild Trout Program

Prepared by Jeff Weaver and Stephanie Mehalick

Introduction:

The East Fork San Gabriel River (East Fork) is located in Los Angeles County approximately 40 miles to the northeast of Los Angeles, CA within the Angeles National Forest and supports wild populations of coastal rainbow trout (*Oncorhynchus mykiss irideus*) within their native range (Figure 1). The California Department of Fish and Game (DFG) Heritage and Wild Trout Program (HWTP) is currently evaluating the East Fork as a candidate for designation as both a Heritage and Wild Trout Water. Wild Trout Waters are those that support self-sustaining (wild) populations of trout, are aesthetically pleasing and environmentally productive, provide adequate catch rates in terms of numbers or size of trout, and are open to public angling. Wild Trout Waters may not be stocked with catchable-sized hatchery trout (Bloom and Weaver 2008). Heritage Trout Waters are a sub-set of Wild Trout Waters and highlight wild populations of California's native trout that are found within their historic drainages.

In 1997, 2000, and 2003, the HWTP conducted multiple-pass electrofishing surveys at various sites in the lower portion of the East Fork, in the vicinity of Heaton Flat and San Gabriel Reservoir. To increase the geographic range of sampling within the East Fork drainage and obtain current information on trout distribution, size classes, and density estimates, the HWTP conducted Phase 2 candidate water assessments in 2009 on the East Fork and two headwater tributaries (Iron Fork and Fish Fork) via direct observation and hook and line surveys. HWTP Phase 2 (candidate water) assessments provide a comprehensive evaluation of the fishery, habitat, and angler use including information on species distribution, size class structure, and abundance. Hook and line surveys provide information on species composition, distribution, size class structure, and catch rates. Hook and line surveys also allowed for the collection of tissue samples for future genetic analysis and examination of trout in-hand to better understand their origins, whether hatchery-reared or wild.

For long-term monitoring of angler use on the East Fork, the HWTP maintains an angler survey box (ASB) located at Heaton Flat (Figure 2). Voluntary angler-provided data from this ASB provide further insight into this fishery over multiple years including catch rates, catch size, angling pressure, and angler satisfaction. Data from this box were analyzed for the years 2003 through 2009 and were incorporated into this report.

Direct Observation Methods:

The HWTP conducted direct observation surveys at 20 locations throughout the upper watershed of the East Fork within Sheep Mountain Wilderness using snorkeling methods, an effective survey technique in many small streams and creeks in California and the Pacific Northwest (Hankin and Reeves 1988; Figure 2). Surveys occurred between June 23 and 25, 2009 and were located on the East Fork, Iron Fork, and Fish Fork. Sections were spaced approximately every one-quarter mile and the start of each section was selected at random. Specific

section boundaries were located at distinct breaks in habitat type and/or stream gradient. Surveys were conducted in an upstream direction with either one or two divers; the number of divers per survey section was determined based on wetted width, water visibility, and habitat complexity (Table 1).

Figure 1. Vicinity map of 2009 East Fork survey location.

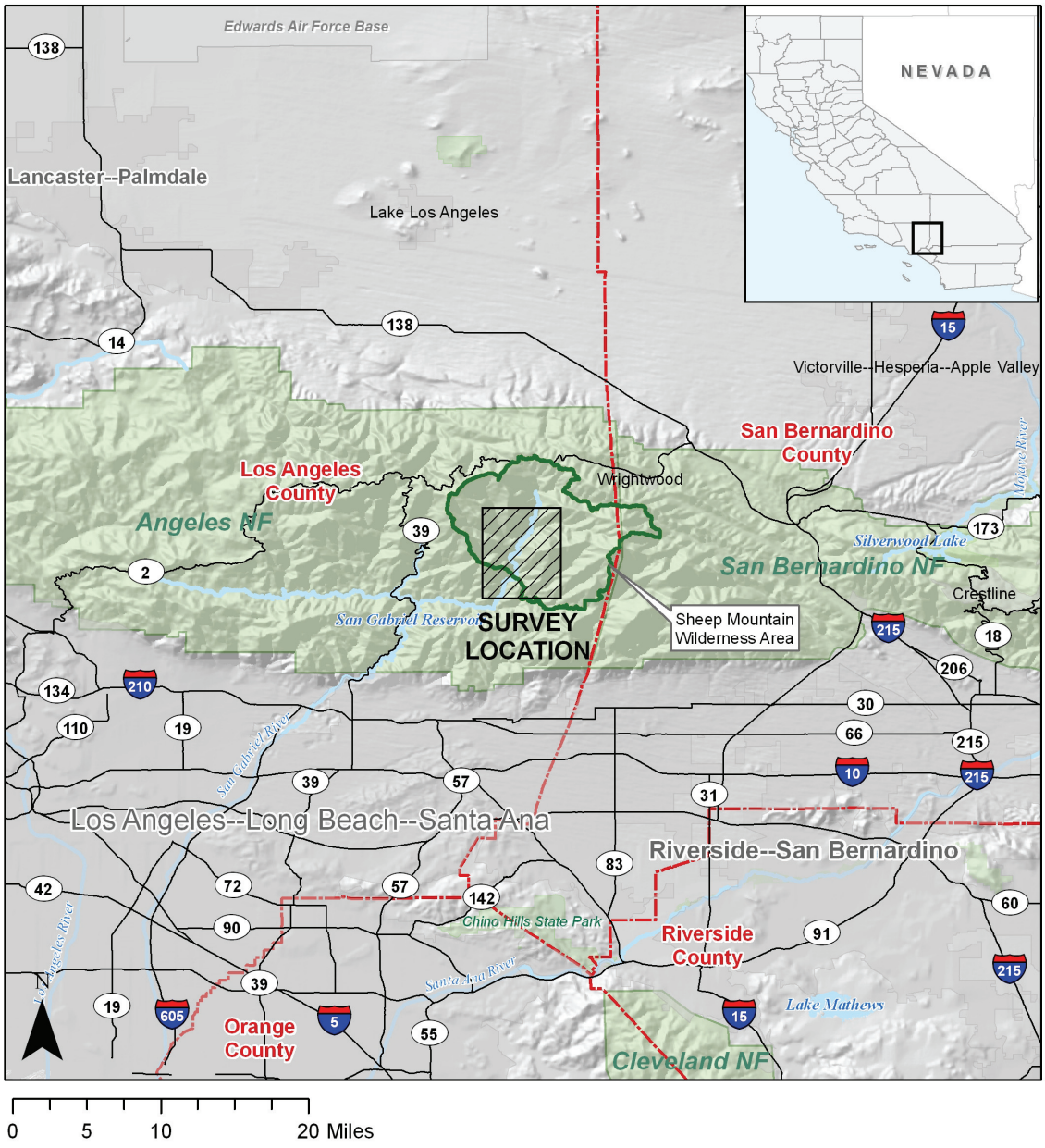
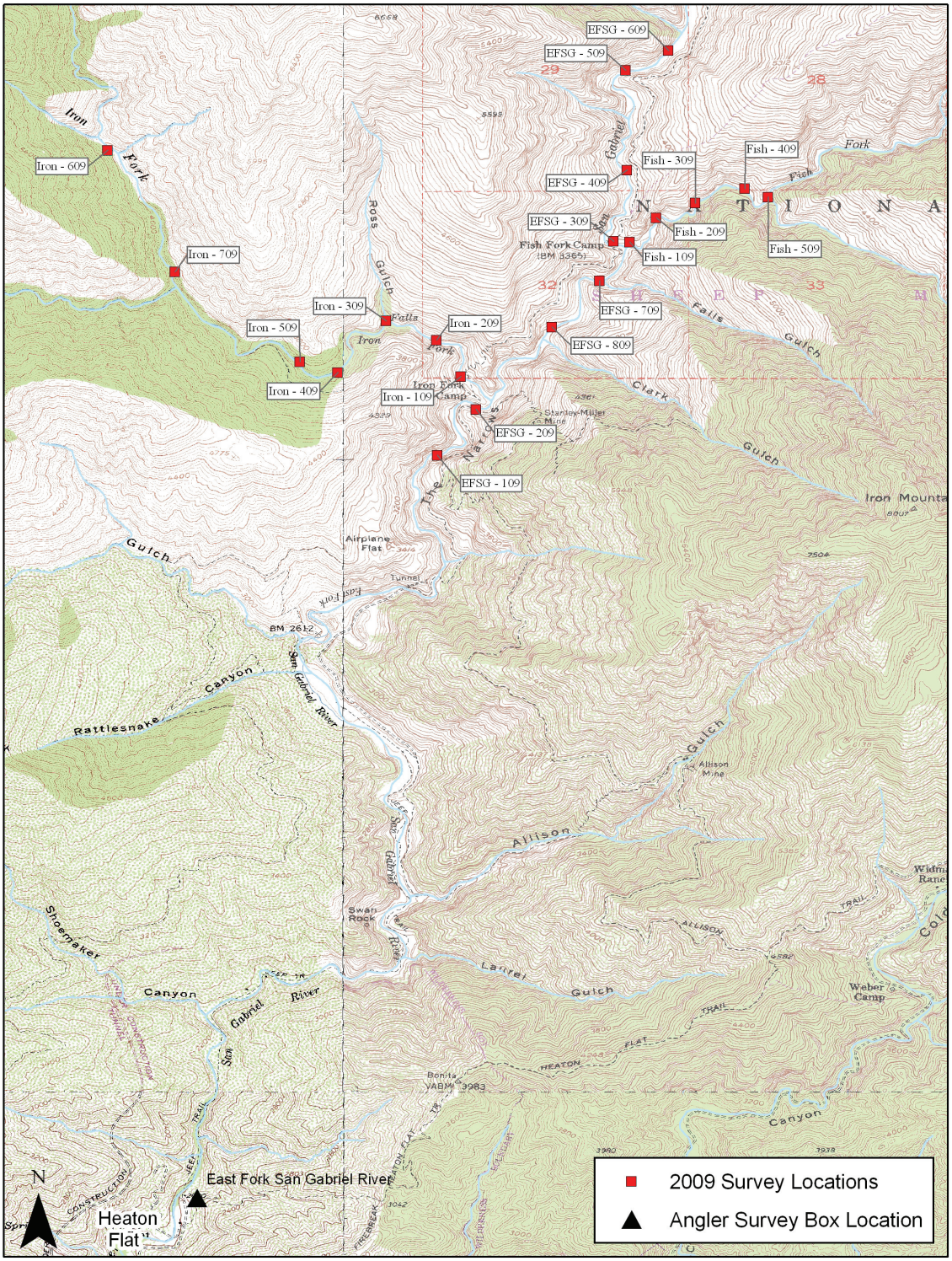


Figure 2. Detail map of 2009 East Fork section locations and Angler Survey Box location.



Quad: Crystal Lake, Mt. Baldy, Glendora and Mount San Antonio (7.5')

Table 1. 2009 direct observation section information for the East Fork San Gabriel River, Iron Fork, and Fish Fork.

Water	Survey date	Section number	Number of divers
East Fork San Gabriel River	6/23/2009	109	2
		209	2
	6/25/2009	309	1
		409	1
		509	2
		609	2
		709	2
		809	2
Iron Fork	6/24/2009	109	2
		209	2
		309	2
		409	2
		509	2
		609	1
		709	1
Fish Fork	6/25/2009	109	1
		209	1
		309	1
		409	1
		509	1

Divers, maintaining an evenly spaced line perpendicular to the current, counted fish by species. All observed trout were further separated and counted by size class. Size classes were divided into the following categories: young of year (YOY); small (< 6 inches); medium (6-11.9 inches); large (12-17.9 inches); and extra-large (≥ 18 inches). YOY are defined by the HWTP as age 0+ fish, emerged from the gravel in the same year as the survey effort. Depending on species, date of emergence, relative growth rates, and habitat conditions, the size of YOY varies greatly, but are generally between zero and three inches in total length. If a trout was observed to be less than six inches in total length but it was difficult to determine whether it was an age 0+ or 1+ fish, by default it was classified in the small (<6 inches) size class.

Divers were instructed in both visual size class estimation and proper snorkel survey techniques prior to starting the survey (establishing a dominant side, determining the extent of their visual survey area, how and when to count (or not count) fish observed, safety considerations, etc.). For each section, surveyors measured section length along the thalweg, water and air temperature (in the shade), average wetted width and water depth, and water visibility. Habitat type (flatwater, riffle, or pool) was identified following Level 2 protocol as defined in the

California Salmonid Stream Habitat Restoration Manual (Flosi et al. 1988). Representative photographs were taken and GPS coordinates were recorded for the section boundaries. To calculate estimates of abundance, the HWTP summed all observed coastal rainbow trout in all sections and divided by the total survey length (this density estimate was calculated individually for each of the three forks surveyed and was expressed in fish per mile).

Angling Methods:

An angling effort was conducted on the East Fork, Iron Fork, and Fish Fork in an effort to provide information on catch rates and size class distribution and to collect genetic tissue samples of coastal rainbow trout. Tissue samples were collected in both the Iron Fork and Fish Fork for cataloging and potential future genetic analyses as part of the Southern California Rainbow Trout Tissue Sampling Project (McKibbin 2010). In collaboration with Fisheries Resource Conservation Corps (FRVC) volunteers, the HWTP collected tissue samples at multiple sites throughout each fork. Surveyors collected as many tissue samples as possible, based on time constraints and capture feasibility. Fish were captured by hook and line (fly fishing gear) and were measured to the nearest inch using a calibrated landing net (total length). Tissue samples were collected by removing a portion of the caudal fin with a pair of scissors, and were placed in a labeled envelope with a unique identification number. Representative photographs were taken of the specimens collected. The HWTP Southern Region biologist has assumed responsibility of all tissue samples and is storing them until further analysis is warranted and funding is available. In addition to tissue collection, angling effort (hours) and the total number of fish captured were recorded in order to determine catch rates in different parts of the drainage. In some cases, a fish was caught but escaped before tissue acquisition could be performed. In these instances, catch rate and size class data were still collected.

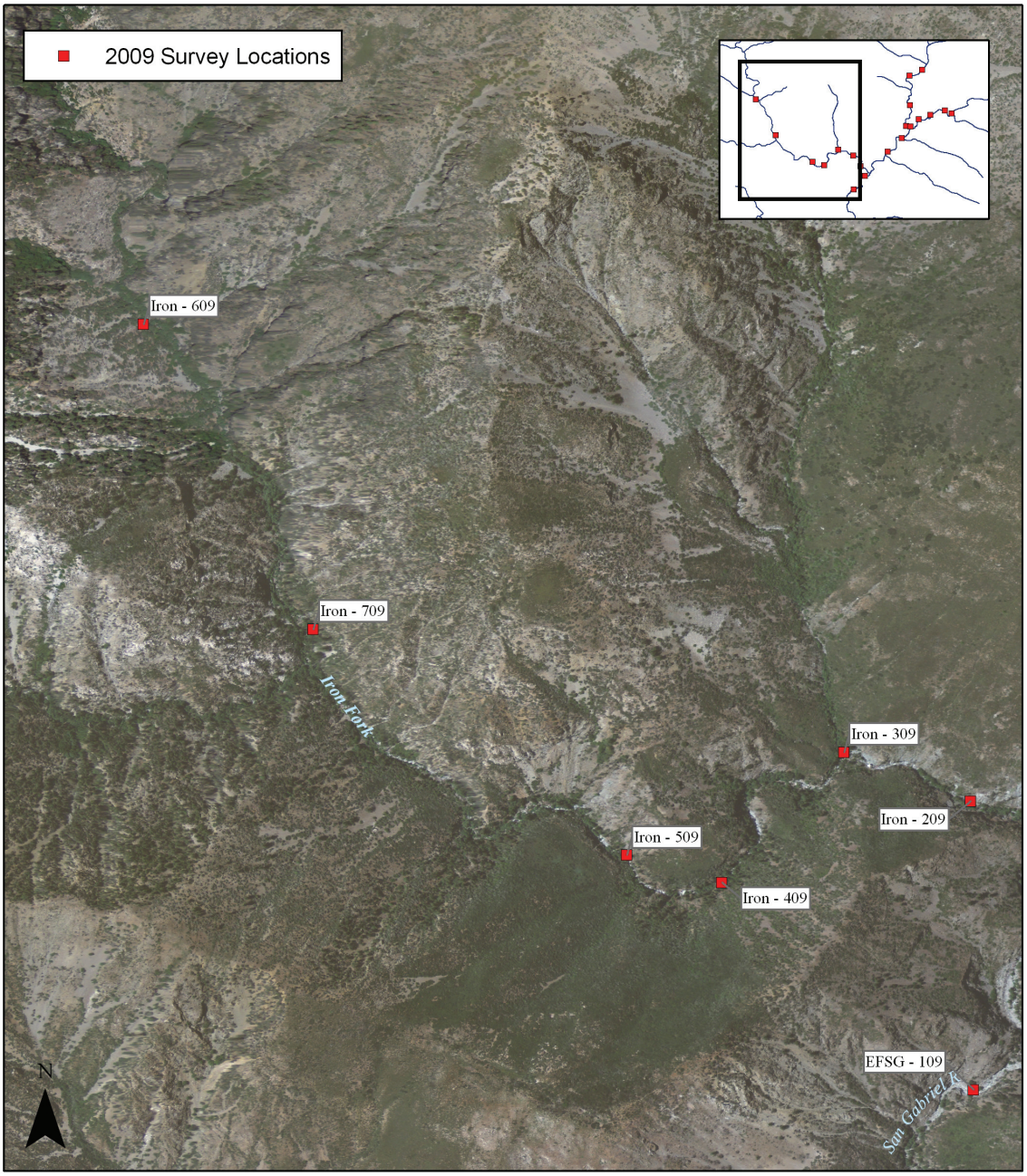
Data from the ASB located at Heaton Flat on the East Fork San Gabriel River were extracted from the DFG Fisheries Information Sharing Host (FISH) database to better understand angling pressure and catch rates for the years 2003 through 2009.

Direct Observation Results:

The East Fork was surveyed on June 23 and 25, 2009 at eight locations (Sections 109-809) spanning a distance of approximately four river miles (Figures 3 and 4). All sections were located within Sheep Mountain Wilderness and the downstream-most section (Section 109) was located approximately six miles upstream of Heaton Flat. The East Fork is a medium-gradient stream flowing through a confined canyon with substrate dominated by cobble and boulders (Figure 5). Water temperatures ranged from 15 ºC to 19 ºC and, depending on the time of day, the air temperature was between 21 ºC and 28 ºC. The average wetted width of the eight sections was 15.6 feet and the average

water depth was 0.8 feet. Water visibility ranged from four feet to greater than 10 feet. A total of 131 coastal rainbow trout were observed in the East Fork in 445.8 feet of stream habitat; this was the only fish species observed in all survey sections in 2009, including those in the Iron and Fish forks (Table 2). Size classes ranged from YOY to medium with no large or extra-large fish. The majority of fish observed were in the small size class (87%). The estimated density of coastal rainbow trout for the East Fork was 1,552 fish per mile (average of Sections 109-809 combined).

Figure 3. Detail map of 2009 East Fork Section 109 and Iron Fork Sections 209-709.



0 0.25 0.5 Miles

Image Source: NAIP 2009

Figure 4. Detail map of 2009 East Fork Sections 209-809, Fish Fork Sections 109-509, and Iron Fork Section 109.

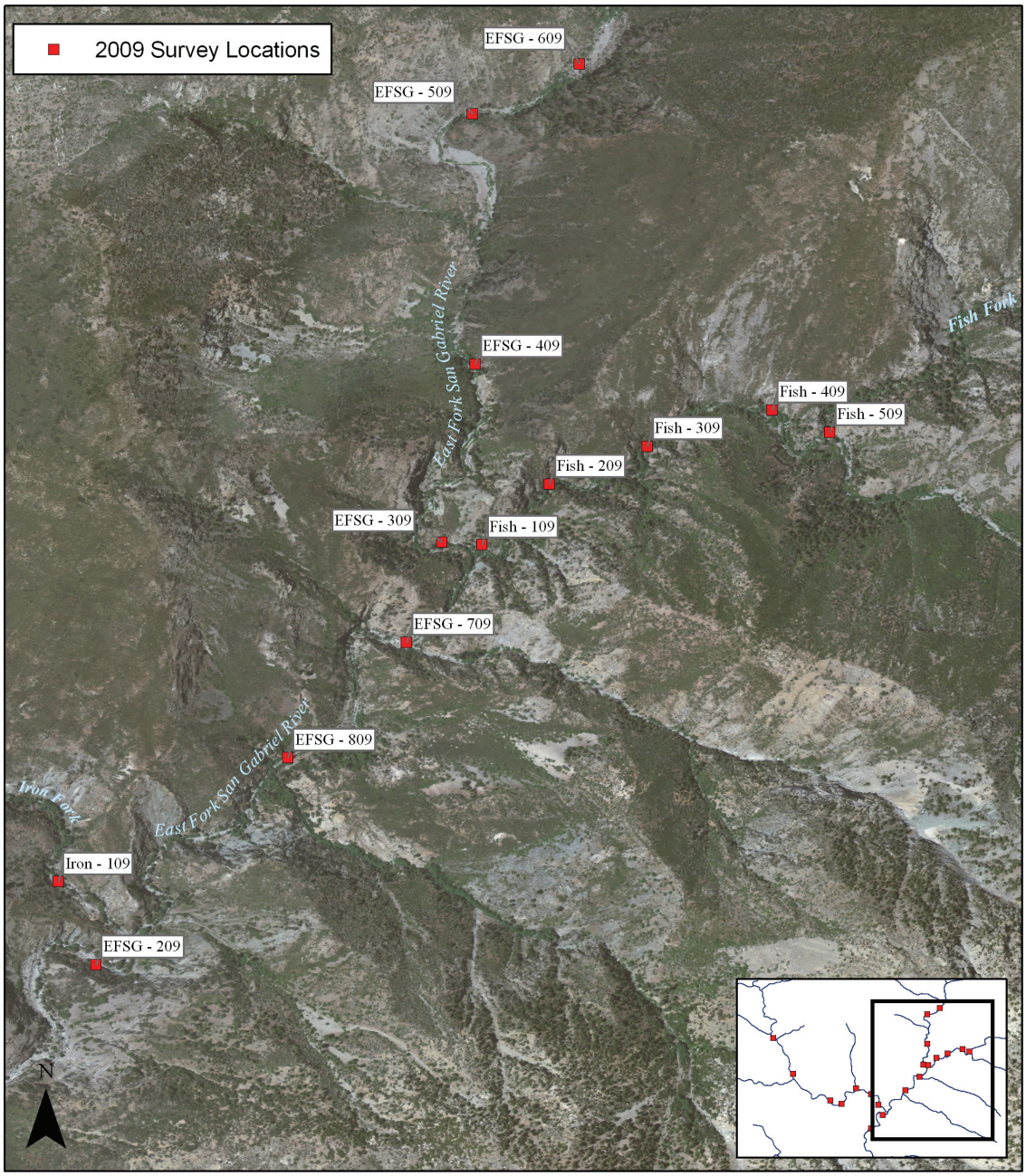


Image Source: NAIP 2009

0 0.25 0.5 Miles

Table 2. 2009 direct observation survey data from the East Fork San Gabriel River.

Section number	Section Length (ft)	Habitat type	Number of coastal rainbow trout observed						Estimated density (fish/mi)
			YOY	Small < 5.9"	Medium 6" - 11.9"	Large 12" - 17.9"	Xlarge > 18"	Totals	
109	69.2	Pool	0	56	5	0	0	61	4654
209	85.0	Riffle	2	19	1	0	0	22	1367
309	41.5	Flatwater	0	3	1	0	0	4	509
409	68.0	Riffle	3	1	0	0	0	4	311
509	27.0	Pool	0	2	0	0	0	2	391
609	53.0	Flatwater	0	11	0	0	0	11	1096
709	52.3	Flatwater	0	12	4	0	0	16	1615
809	49.8	Flatwater	0	10	1	0	0	11	1166
Total	**445.8**	**n/a**	**5**	**114**	**12**	**0**	**0**	**131**	**1552**

Figure 5. Site photographs of the East Fork San Gabriel River.

The Iron Fork was surveyed on June 24, 2009 at seven locations (Sections 109-709) from the confluence with the East Fork upstream approximately three miles

(Figures 3 and 4). Stream gradient was moderate to high and was constricted within steep canyon walls (Figure 6). Substrate was dominated by cobble and boulders. Water temperatures were measured between 13 ºC and 16 ºC and air temperatures were between 18 ºC and 27 ºC, depending on the time of day. A total of 408.9 feet of stream habitat was surveyed (Sections 109-709 combined), with an average wetted width of 16.1 feet and an average water depth of 1.2 feet. Water visibility ranged from six feet to greater than 10 feet. A total of 102 coastal rainbow trout were observed; 82% of these were in the small size class (not including YOY; Table 3). Numerous YOY were observed in the stream margins outside of the boundaries of the seven survey sections; however, only four YOY were observed within the survey sections themselves. The 2009 estimated density of coastal rainbow trout in the Iron Fork was 1,317 fish per mile.

Table 3. 2009 direct observation survey data from the Iron Fork.

Section number	**Section Length (ft)**	**Habitat type**	**Number of coastal rainbow trout observed**						**Estimated density (fish/mi)**
			YOY	**Small < 5.9"**	**Medium 6" - 11.9"**	**Large 12" - 17.9"**	**Xlarge > 18"**	**Totals**	
109	30.0	Pool	1	4	0	0	0	5	880
209	108.0	75% Riffle/ 25% Pool	0	12	1	0	0	13	636
309	93.9	Flatwater	0	4	0	0	0	4	225
409	54.0	Riffle	0	1	0	0	0	1	98
509	42.0	Riffle	0	29	1	0	0	30	3771
609	45.0	Flatwater	2	0	11	0	0	13	1525
709	36.0	Pool	1	34	1	0	0	36	5280
Total	**408.9**	**n/a**	**4**	**84**	**14**	**0**	**0**	**102**	**1317**

Figure 6. Site photographs of the Iron Fork.

The Fish Fork was surveyed on June 25, 2009 at five locations (Sections 109-509) from the confluence with the East Fork upstream approximately one mile (Figure 4). Stream gradient was low to moderate with substrate dominated by boulders, cobble, and gravel with some silt in pool habitats. The Fish Fork was heavily shaded with riparian alders (*Alnus* spp.) and instream woody debris (Figure 7). Stream temperatures were between 13 ºC and 16 ºC and the air temperature ranged between 21 ºC and 30 ºC, depending on the time of day. A total of 302.2 feet of stream habitat was surveyed (Sections 109-509 combined) with an average wetted width of 12.2 feet and an average water depth of 0.7 feet. Water visibility ranged from three to five feet. HWTP divers counted 90 coastal rainbow trout; the small size class accounted for 88% of the fish observed (not including YOY; Table 4). The 2009 average density of coastal rainbow trout in the Fish Fork was 1,572 per mile.

Table 4. 2009 direct observation survey data from the Fish Fork.

Section number	Section length (ft)	Habitat type	Number of coastal rainbow trout observed					
			YOY	Small < 5.9"	Medium 6" - 11.9"	Large 12" - 17.9"	Xlarge > 18"	Totals
109	83.2	Riffle	0	3	0	0	0	3
209	80.8	Flatwater	0	7	1	0	0	8
309	25.2	Pool	0	17	0	0	0	17
409	60.0	Pool	6	28	1	0	0	35
509	53.0	Pool	0	24	3	0	0	27
Total	**302.2**	**n/a**	**6**	**79**	**5**	**0**	**0**	**90**
Estimated density (coastal rainbow trout per mile) =								**1572**

Figure 7. Site photographs of the Fish Fork.

Angling Results:

Catch rates during the 2009 surveys ranged from three fish per hour on the Fish Fork to 40 fish per hour on the East Fork (Table 5). The average catch rate was also highest on the East Fork. Genetic tissue samples were collected from 68 coastal rainbow trout in the Iron and Fish forks (Figure 8). No tissue samples were collected on the East Fork in 2009, as samples had been previously collected in this portion of the drainage by DFG's South Coast Region.

Table 5. Summary of 2009 angling data from the East Fork San Gabriel River, Iron Fork, and Fish Fork.

Water	Number of anglers	Date	Total hours fished	Number of trout caught	Number of genetic tissue samples collected	Catch rate (fish per hour)
East Fork San Gabriel River	1	6/24/2009	1	40	0	40
	1	6/25/2009	1	30	0	30
	Average catch per hour					**35**
Iron Fork	1	6/23/2009	0.33	5	0	15
	1	6/24/2009	1	8	0	8
	1	6/24/2009	0.33	2	0	6
	2	6/24/2009	6	30	29	5
	2	6/24/2009	3.17	17	15	5
	Average catch per hour					**8**
Fish Fork	2	6/25/2009	5.5	19	19	3
	3	6/25/2009	1.17	5	5	4
	Average catch per hour					**4**

Figure 8. Photograph of FRVC volunteer collecting tissue samples on the Iron Fork (left) and photograph of coastal rainbow trout from the Fish Fork (right)

Data from the ASB located at Heaton Flat on the East Fork San Gabriel River were examined for the years 2003 through 2009 (Table 6). This ASB is located downstream of the 2009 study area; however, roads allow relatively easy access to this ASB and it is assumed that the majority of fishing on the East Fork occurs in this area. Voluntary fishing information from this ASB provides further insight into this fishery, including angling pressure, catch rates, and catch sizes. Based on the number of anglers who completed these forms, it appears that angling pressure was relatively high. Catch rates are similar for all years and averaged 2.18 fish per hour. The majority of fish captured were in the small and medium size classes.

Table 6. ASB data from the East Fork San Gabriel River (2003-2009).

Year	Total anglers	Total hours fished	Trout captured by size class			Total number of trout caught	Average catch rate (trout per hour)
			Small	Medium	Large		
2003	142	519	422	617	14	1053	2.03
2004	138	576	282	522	32	836	1.45
2005	63	250	134	348	15	497	1.99
2006	129	516.5	503	659	23	1185	2.29
2007	132	501	570	570	11	1151	2.30
2008	146	581.75	1009	488	44	1541	2.65
2009	149	595.5	1087	379	1	1467	2.46
Total	**899**	**3539.75**	**4007**	**3583**	**140**	**7730**	**2.18**

The HWTP has conducted multiple-pass electrofishing surveys at three sites on the East Fork between 1997 and 2003 (Table 7). The results of these surveys show a range in the estimated coastal rainbow trout population between 253 fish per mile at Heaton Flat (2003) to nearly 7,000 fish per mile at Shoemaker Canyon (1997). Shoemaker Canyon is located approximately one mile upstream of Heaton Flat. In addition to coastal rainbow trout, other species captured included Santa Ana sucker (*Catostomus santaanae*), speckled dace (*Rhinichthys osculus*), and arroyo chub (*Gila orcutti*). Santa Ana suckers are a federally listed threatened species. Only coastal rainbow trout were observed farther upstream during the 2009 surveys.

Table 7. Historic multiple-pass electrofishing data for the East Fork San Gabriel River by section and year (1997-2003).

Section	Location description	Survey date	Section length (ft)	coastal rainbow trout			
				Number captured	Population estimate	Estimated density (fish/mile)	Estimated biomass (lbs/acre)
1	Heaton Flat	7/18/1997	346	240	256	3906.59	50.48
1	Heaton Flat	6/14/2000	256	82	131	2701.88	31.64
2	Shoemaker Canyon	9/24/1997	318	369	403	6691.32	28.67
2	Shoemaker Canyon	6/13/2000	303	79	95	1655.45	13.91
5	Heaton Flat	7/15/2003	230	8	11	252.52	n/a

Conclusion:

The East Fork San Gabriel River and its tributaries contain wild populations of coastal rainbow trout within their native range in close proximity to California's largest metropolitan area. In addition, the upper East Fork drainage is within the native distribution of federally-listed endangered mountain yellow-legged frogs (*Rana muscosa*) and 2472 acres are designated as critical habitat (Fish and Wildlife Service 2006). This critical habitat includes Bear Gulch, Vincent Gulch, Fish Fork, Iron Fork, and Alder Gulch. No mountain yellow-legged frogs were observed in 2009. The lower portion of the watershed is easily accessed by road; however, the upper watershed is remote, roadless, and within a designated wilderness area. During the 2009 surveys, there were numerous individuals observed panning for gold (upstream of the Bridge to Nowhere and downstream of the Iron Fork) and there were numerous make-shift camps set up along the river presumably for this purpose (both occupied and unoccupied). Fishing on the East Fork is open year-round with a five fish-bag limit (DFG Southern District General freshwater fishing regulations). As of 2008, the DFG no longer stocks hatchery fish in the East Fork (McKibbin, personal communication, 2010). Angling pressure appears relatively high and, although there are not many large-sized fish in the system, catch rates exceed two fish per hour. The 2009 direct observation survey results show relatively high densities of coastal rainbow trout throughout the upper watershed and those fish captured by hook and line appeared wild. Based on these parameters, the HWTP recommends pursuing the East Fork and all tributaries from Heaton Flat upstream for designation as both a Heritage and Wild Trout Water.

For future assessments, the HWTP recommends:

1. Multiple-pass electrofishing surveys on the East Fork at Heaton Flat and Shoemaker Canyon to yield estimates of fish abundance (biomass and density) and to better understand species distribution and size class structure of coastal rainbow trout, Santa Ana sucker, and speckled dace.

2. Multiple-pass electrofishing surveys on the Prairie Fork to yield estimates of trout abundance.

3. Direct observation snorkel surveys on the East Fork and other headwater tributaries (including the Prairie Fork) to gather more information on species distribution, composition, and abundance (including fishes and mountain yellow-legged frogs).

4. Delineate distribution of Santa Ana sucker.

5. Continued monitoring of the ASB at Heaton Flat.

Heritage and Wild Trout Program Headquarters and South Coast Regional staff will continue to collaborate on filling data gaps in the upper-most portions of the drainage, with the near-term goal of designating this popular and important southern California recreational fishery as both a Heritage and Wild Trout Water.

References:

Bloom, R., and J. Weaver. 2008. The California Heritage and Wild Trout Program Handbook (Draft). State of California. Natural Resources Agency. Department of Fish and Game. Rancho Cordova, CA.

Fish and Wildlife Service. 2006. Designation of Critical Habitat for the Southern California Distinct Population Segment of the Mountain Yellow-Legged Frog (*Rana muscosa*). Department of the Interior. Fish and Wildlife Service. Federal Register. Vol. 71, no. 178.

Flosi, G., S. Downie, J. Hopelain, M. Bird, R. Coey and B. Collins. 1998. California Salmonid Stream Habitat Restoration Manual. State of California Resources Agency. 3rd Edition. Department of Fish and Game. Vol. 1.

Hankin D.G. and G.H. Reeves. 1988. Estimating total fish abundance and total habitat area in small streams based on visual estimation methods. Canadian Journal of Fisheries and Aquatic Sciences. 45:834-844.

McKibbin, C., and S. Jacobson. 2010. Southern California Rainbow Trout Tissue Sampling Project. State of California. Natural Resources Agency. Department of Fish and Game. Ventura, CA.